

**Amendments to the Specification:**

Please replace the paragraph [0024] with the following paragraph:

[0024] Amplifier 52 is configured for amplifying the received analog electrical signals from the ultrasound probe 12. In one embodiment, the received electrical signals are range from micro volts to milli volts and are amplified to a few volts. In one embodiment, the amplifier is implemented using analog devices such as transistors. Optical conduit 54 receives the amplified analog electrical signals from amplifier 52 on line 53. The optical conduit also receives continuous wave light generated by light source 56 on line 55. The optical conduit is configured for transforming the analog electrical signals to optically modulated analog signals and is transmitted to the optical detector 30 on line 57. Transmitting the optically modulated analog signals is advantageous because it eliminates the need for an analog to digital converter in the probe. The presence of the analog to digital converter in typical probe systems results in higher power requirements. In addition, the probe size is increased due to the addition of the analog to digital converter.

Please replace the paragraph [0026] with the following paragraph:

[0026] Fig. 3 is a block diagram illustrating an optical waveguide using an electro-optic modulator implemented according to one aspect of the invention. Optical waveguide 60 54 receives the electrical signals from the ultrasound probe 12 as well as continuous wave light from light source 56 as inputs. Electro-optic modulator 62 is configured for modulating the continuous wave light with the electrical signals received from the ultrasound probe to generate the optically modulated analog signals shown by reference numeral 57. The optically modulated analog signals are then transmitted to optical detector and the processing subsystem for further processing. The electro-optic modulator is implemented using polymer materials. Polymer material is best suited for electro-optic modulators because of compactness and reduced input power requirements. In addition, polymer modulators are lossless devices and hence do not generate substantial amount of heat in the ultrasound system. In a further embodiment of the invention as illustrated in Fig.4, a multiplexer 66 is used in receiver 24. As described with reference to Fig.1, ultrasound probe 12 comprises a plurality of transducer elements 71-82, each transducer configured to generate an electrical signal representative of the backscattered waves. The electrical signals are collectively shown by reference numeral 53.